REDESCRIPTION OF DISCOTHYREA TESTACEA ROGER, A LITTLE-KNOWN NORTH AMERICAN ANT, WITH NOTES ON THE GENUS (HYMENOPTERA: FORMICIDÆ)

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The primary purpose of this paper is to redescribe and figure *Discothyrea testacea* Roger, an almost unknown North American ant, and to furnish such historical and biological facts concerning it as may be of interest. The genus *Discothyrea* is also discussed and all the known species listed.

In 1863 (Berlin. Ent. Ztschr. 7: 176-177) Roger described a new genus and species of ponerine ant, *Discothyrea testacea,* on the basis of a worker and dealated female. His generic description was unusually thorough, his specific description extremely brief. Through some unfortunate oversight he failed to designate a specific type locality; however, this was remedied later in 1863 in his "Verzeichniss der Formiciden — Gattungen und Arten," where he gave "Nord Amerika" as the general type locality without further remark.

From 1863 until 1948 no one in this country succeeded in finding additional individuals, and the presence of *testacea* in North America was becoming a matter of considerable doubt. Such well-known works as Wheeler's, 1910 and 1926 editions of "Ants"; Smith's, 1947, "A Generic and Subgeneric Synopsis of the United States Ants, Based on the Workers"; and Creighton's, 1950, "Ants of North America", made no mention of the genus or species. So far as we are aware, no one in North America has ever seen Roger's types. A number of workers, especially beginners, did not know that *Discothyrea* had ever been recorded for North America, although the species *testacea* is listed for North America by Emery (1911, in Wytsman's Genera Insectorum, fascicule 118, p. 52). Emery

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apparently recorded the form from North America entirely on the basis of Roger's original statement. Not only had our workers failed to find *testacea,* but even another North American species, *Ponera gilva* (now *Euponera gilva)* described by Roger in 1863, was not collected again until 1919. The authors do not believe that either species is so rare that it should not have been collected on numerous occasions during this time. Credit for collecting the first *Discothyrea* since Roger's time, though, should go to the junior author, who found a single worker on August 29, 1948, while collecting from soil humus by means of a Berlese funnel about three miles from Holly Springs (Wake County), North Carolina. Less than a year later (April 29, 1949) H. T. Vanderford found three workers of *Discothyrea* adhering to the roots of a swamp fern growing on the edge of an old salt marsh lake at Savannah, Georgia. Approximately two months later he collected two additional workers and a dealated female from almost the same spot, an area of approximately six square feet. Vanderford kindly permitted us to study all his specimens except one worker, and we came to the conclusion that they represent the same species as that of the individual collected in North Carolina which we believed to be Roger's *testacea.*

Realizing that Roger's types should be in the Zoological Museum of the University of Berlin, we sent H. Bischoff one worker each of the North Carolina and Georgia individuals to be compared with the type. At the same time we requested Dr. Bischoff to furnish us with as detailed information as possible concerning specific locality, date, and collector of the types. After comparing our individuals with the type Dr. Bischoff pronounced them to be the same species. He also stated that there were no original labels of Roger's attached to the type, but only labels by Gerstäcker as follows: "*Discothyrea testacea* Rog.*, Amer. Sept." The asterisk following Roger's name is interpreted as indicating type designation. No further information was available, but it is Dr. Bischoff's opinion that the type specimens may have been sent to Roger by Christian Zimmerman from one of the Carolinas. Upon reading the biography of Dr. Zimmerman we learned that he was a German who migrated to and lived in the United States from 1832 to 1867, mostly in Georgetown and Columbia, South Carolina. He had been a teacher of music and drawing

and a collector and student of insects, mostly Coleoptera. It appears that we shall never know for certain the locality or collector of *testacea,* and that we can only surmise that the species was collected in the Carolinas, probably by Zimmerman. This is especially unfortunate, since *testacea* is the genotype of *Discothyrea.*

So far as we know, only 21 forms of *Discothyrea* have been described, these having been recorded from all the faunal realms except the Palearctic. The ants are believed to be well adapted to the Temperate and Torrid Zones of the earth. The forms and the faunal realms from which they have been recorded are as follows:

Nearctic

testacea Roger (the genotype), 1863, worker, dealate female, (probably North or South Carolina).

Neotropical

denticulata Weber, 1939, worker, Forest Settlement, Mazaruni River, British Guiana.

horni Menozzi, 1927, alate female, fig. 1, San Jose, Costa Rica.
Menozzi, 1937, worker, San Jose, Costa Rica.

humilis Weber, 1939, dealate female, Barro Colorado Island, Panama Canal Zone.

icta Weber, 1939, dealate female, grounds of Imperial College of Tropical Agriculture, St. Augustine, Trinidad, British West Indies.

isthmica Weber, 1940, dealate female, Barro Colorado Island, Panama Canal Zone.

neotropica Bruch, 1919-1920, dealate female, 3 figs., Alta Gracia, Province of Cordoba, Argentina.

Ethiopian

hewitti Arnold, 1916, worker, Grahamstown, Cape Province, South Africa.

oculata Emery, 1901, worker, alate female, male, Cameroons, Africa.

oculata var. *sculptior* Santschi, 1913, worker, French Congo, Africa.

patrizzi Weber, 1949, worker, dealate female, fig. 1, Kenya, Africa.

traegaordhi Santschi, 1914, worker, Pietermaritzburg, Natal, Africa.

Oriental

globus Forel, 1905, worker, Tjompea, Java.

globus var. *sauteri* Forel, 1912, worker, dealate female, Pilam, Formosa.

Australian

antarctica Emery, 1895, worker, North Island, New Zealand. Emery, 1897, worker, pl. 2, fig. 8, Hunua Mountains, New Zealand. Moore, 1938, biology and distribution.

bidens Clark, 1927-1928, worker, pl. 1, figs. 30, 31, Victoria, Australia.

clavicornis Emery, 1897, worker, pl. 15, figs. 39, 40, German, New Guinea.
Mann, 1919, alate female, fig. 6, Fulakora, Ysabel, British Solomon Islands.

crassicornis Clark, 1926-1927, worker, pl. 6, figs. 4, 4a, worker, Manjimup, Western Australia.

leæ Clark, 1934, dealate female, pl. 2, fig. 11, Mt. Lofty, Southern Australia.

remingtoni Brown, 1948, worker, figs. 1A, 1B, 7 Mi S. E. La Foa, New Caledonia.

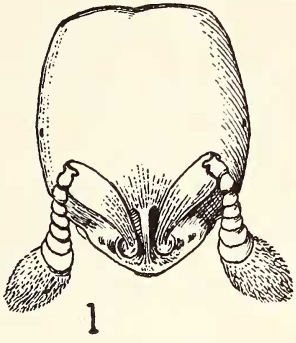
turtoni Clark, 1934, worker, dealate female, pl. 4, figs. 5, 6, Otway Range, Australia.

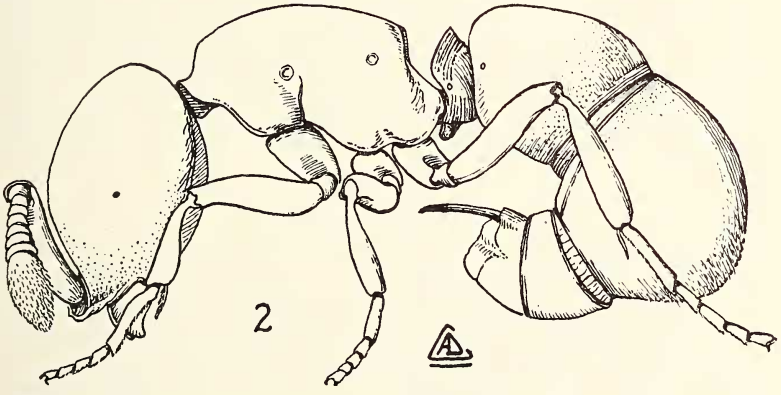
The worker of our North American *Discothyrea* is readily distinguishable from that of other North American ponerine genera in the possession of a 9-segmented antenna[3], the funiculus of which is strongly thickened (clavate) toward the apex and the last funicular segment remarkably enlarged, oval and approximately as long as the combined lengths of the preceding funicular segments; the semicircular, disk-like clypeus extended above the mandibles; extremely minute or almost obsolescent eye; dorsum of thorax without sutures; gaster strongly curved anteroventrally with the apical segments protruding from the venter rather than the apex of the large, second gastric segment; erect hairs lacking from most of the body except usually

[3]Some species of *Discothyrea* are known to have only a 7-segmented antenna, the reduction in segments probably being due to fusion. One should be cautious, therefore, in accepting a given number of segments as being invariable for a species. It is not impossible that individuals in a colony may have a variable number of segments composing the antenna.

the apex of the gaster; body unusually small (less than 2 mm.) and with a dull opaque or subopaque cast.

The North American female is very similar to the worker except for her larger size, possession of wings (when a virgin), and modifications of the head and thorax such as ocelli, compound eyes, and the





Worker of *Discothyrea testacea* Roger. Fig. 1, anterior view of head. Fig. 2, lateral view of body (illustrations by Arthur D. Cushman).

extra sclerites of the thorax. We have not seen a *Discothyrea* male, but a male of *oculata,* an African species, is known to have a 13-segmented antenna with a short scape, which is approximately as long

as the combined lengths of the first three funicular segments, the frontal carinæ fused to form a single vertical plate as in the worker and female, the thorax with Mayrian furrows, the anterior wing lacking a disocidal cell but having at least one closed cubital cell, the petiole and gaster almost as those of the other castes.

Although *Discothyrea* is an ancient and relict genus, we are not aware of any fossil forms. These highly specialized ants are well adapted to their cryptotobiotic life. Little is known concerning their feeding habits, but it is almost a certainty that they are carnivorous, probably on some of the small organisms near the surface of the soil, humus, or well rotted cavities of logs and stumps. Their unusually small colonies must not comprise more than a dozen or so adult individuals and should be found in the habitats mentioned above. It is quite likely that females establish colonies alone without the assistance of workers.

Discothyrea testacea Roger, 1863, Berlin. Ent. Ztschr. 7:177, worker, female (without locality). — Roger, 1863, Verzeichniss der Formiciden, Gattungen und Arten, p. 21 (designated "Nord Amerika" as type locality). — Mayr, 1886, Zool. — Bot. Gesell. Wien 36: 438. — Emery, 1895, Zool. Jahrb. Abt. f. System. 8: 226. — W. M. Wheeler, 1911, Ann. N. Y. Acad. Sci. 21: 162. — Emery, 1911, *in* Wytsman's Genera Insectorum, fascicule 118, p. 52. — Weber, 1939, Ann. Ent. Soc. Amer. 32: 99, 101-102, worker, female (in key). — Weber, 1940, Psyche 47: 79. — Donisthorpe, 1943, Ann. and Mag. Nat. Hist. 10: 640. — Borgmeier, 1949, Rev. Brasil Biol. 9: 205, worker, female (in key). — M. R. Smith, 1951, *in* U. S. Dept. Agr. Monogr., No. 2, p. 785.

WORKER. Length 1.55 mm.

Head ovoid, approximately one and one-third times as long as broad (maximum length from the extreme anterior border of the clypeus to the posterior border of the head, 0.46 mm., maximum breadth, eye to eye, 0.34 mm.), with weakly convex sides, rounded posterior corners and almost imperceptibly emarginate posterior border. Compound eye extremely minute, scarcely perceptible, placed on side of head nearer to the base of the mandible than to the posterior border of the head, composed of only a few ommatidia. Antenna 9-segmented, placed near the extreme anterior border of the head; scape short (excluding the pedicel, 0.25 mm. in length), strongly curved and also strongly thickened (clavate) toward the apex; funiculus short and stout, the first segment as long as, or longer than broad, the second through the seventh segments successively widening, each of these being clearly broader than

long, the last funicular segment (eighth) extraordinarily large, oval, and approximately as long as the combined lengths of the preceding funicular segments. Clypeus extended over the mandibles as a plate or disk-like process, the anterior edge of which is subangularly arched (from side to side). Frontal carinæ fused with the clypeus into an extremely thin, vertical plate, which extends from the anterior border of the clypeus between and also past the antennal insertions, the plate bearing a very small but visible hole (viewed in profile). Mandible subtriangular, the masticatory border bearing several rather indistinct denticuli at the base and a fairly distinct and acute tooth at the apex. In profile, dorsum of the thorax rather evenly and moderately arched (anteroposteriorly), meeting the slightly inclined declivity of the epinotum to form a distinct angle. Thorax, from above, 0.46 mm. in length (from the extreme anterior border of the pronotal collar to the point where the dorsum of the thorax meets the epinotal declivity, widest at the pronotal humeri, narrowest at the epinotal tubercles; the promesonotal and mesoepinotal sutures lacking; pronotal humeri rounded or subangular; dorsum of the thorax meeting the epinotal declivity to form a distinct subangular emargination between the epinotal tubercles. Legs moderately long, the femora and tibiæ not especially thickened, the anterior and posterior tibia each with a well developed and distinct spur, the spur apparently lacking on the middle tibia. Petiole, in profile, erect, somewhat wedge-shaped, with the apex of the wedge directed dorsally, ventral border of the petiole with a spine-like lamella; viewed anteriorly, the petiole also appears wedge-shaped, with the highest point of the wedge at about the middle of the dorsal border of the petiole. Gaster from above, 0.63 mm. in length (from the extreme base of the first gastric segment to the extreme apex of the second gastric segment), the first two segments combined form an ellipsoid, the base of which is subtruncate and the apex of which is subangularly rounded; in profile, the much rounded apical segments of the gaster are borne from the venter rather than the apex of the second gastric segment. Extreme apex of gaster with a sting as in other ponerines.

Body and appendages devoid of any erect or suberect hairs. Pubescence scarcely perceptible, grayish, extremely fine and very closely appressed on body and appendages.

Body light brown or yellowish brown to slightly reddish brown, the color depending largely on the intensity of the light, subopaque or opaque, this also depending upon the light intensity. Eyes blackish.

The two Georgia workers are similar to the North Carolina worker except for some minor differences that seem scarcely worth mentioning. Differences in the length of the head, for instance, are very close, 0.03 — 0.04 mm., so these might well be within the range of error in measuring. The epinotal declivity of each of these workers

also appears more vertical, and the general body color more infuscated or sordid.

DEALATE FEMALE. Length 2.01 mm.

Larger than the worker. Total body length obtained in the same manner as with the worker and comprising the following parts, head 0.50 mm., thorax 0.66 mm., gaster 0.85 mm. Differing from the worker largely in the usual female characters such as the possession of ocelli, compound eyes, and thoracic modifications. Other differences are mandible edentate except for the single apical tooth; eye rather large, oval, approximately 0.13 mm. at its greatest width and bearing in this width 10-12 ommatidia, placed approximately 0.05 mm. from the base of the mandible; anterior ocellus borne less than 0.10 mm. behind a transverse line connecting the posterior border of each eye; compound eyes and borders around the ocelli black; pronotal humeri more angular; epinotal declivity apparently more concave. Color similar to that of the two Georgia workers but more sordid than that of the worker from North Carolina.

The redescription of the worker is based largely on the individual from North Carolina which has been carefully compared with the type. The redescription of the female is from the single, dealated Georgia individual.

Type locality — North America (very probably collected in one of the Carolinas by Dr. Christian Zimmerman).

Other localities — 3 miles from Holly Springs (Wake County), North Carolina, Merle W. Wing and Savannah, Georgia, H. T. Vanderford.